

## Instructions for Chemical Hygiene Plan

The development and annual update of a **Chemical Hygiene Plan (CHP)** by the lab supervisor for each individual laboratory under his/her jurisdiction is required (29 CFR 1910.1450) by the Occupational Safety and Health Administration (OSHA). The following CHP Template was developed by Division safety personnel to assist you through the process. Once you have completed and submitted your CHP, please retain a hardcopy for immediate use by lab personnel and an electronic copy for your files.

- Complete each section to reflect your specific laboratory operational needs.
- All sections have italicized directions and examples to assist you.
- Please ERASE the italicized directions for each section when filling in the specifics for your lab.
- Include ONLY those appendices, which pertain to your lab.
- The carcinogens and OSHA appendices can be shortened as needed.

# CHEMICAL HYGIENE PLAN

## *(Coversheet)*

**Laboratory covered under this Plan:**

*[Name of Lab (i.e. Stable Isotope Lab), Room #, and Bldg #]*

**Laboratory Supervisor:** *(Name of Supervisor and Phone number)*

**Laboratory Personnel:** *(Name of Lab personnel and Phone number(s):*  
*When new personnel come on board their names are reflected here and also on the*  
*training log. Use separate page if needed, NOTE: you may have frequent turn-over of*  
*Lab personnel, it is important to keep the cover page and training log up-to-date, keep*  
*a digital version of the CHP readily accessible.)*

**Approved By:** \_\_\_\_\_  
*(Signature of the Lab Supervisor)*

**Date:** *(Date this document was last reviewed and updated by the Lab*  
*Supervisor. Date should change with addition of Lab personnel)*

**Emergency Numbers and other Safety Contacts:**

**Team Safety Officer:** *(Name and phone #)*

**Regional GD Safety Officer:** *(Name and phone #)*

**National Center Emergency Number** *(erase if not located in Reston):* **7222**

**GD Safety Manager:** *(optional)* Wayne Martin **703-648-5289**

<p><b>It is mandatory that all lab workers read the enclosed Chemical Hygiene Plan then initial the Training Log.</b></p>
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## Laboratory Operation:

Name of Lab:

Room No.:

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*(Describe the Laboratory operation in 1 to 3 paragraphs. EXAMPLE: sample preparation lab that uses both physical and chemical means to separate microscopic fossils from carbonate rocks. Samples are crushed, dissolved in HCl then sieved under water to extract fossils...)*

## Potential Hazards for this laboratory:

*(List up to 5 potential hazards or greatest health risks specific for the lab. Use bullets to list and list page numbers of references if desired. You may wish to separate these hazards into Chemical and Physical Hazards)*

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## CHEMICAL HYGIENE PLAN

### A. Standard Operating Procedures for Handling Hazardous Chemicals

#### 1. Protective apparel and equipment:

*(Specify what clothing is not acceptable in the laboratory. For example, open-toed shoes or sandals should not be allowed in labs using chemicals. Loose fitting clothing should also be discouraged. Specify what type of personal protective equipment will be worn, including glasses, splash goggles, face shields, gloves, aprons, lab coats, respirators, etc. Chapters 8 and 9 of the Geological Survey's Safety and Environmental Health Handbook (445-1-H) provide further guidance for selecting equipment. Specify if any specialized safety devices such as audible or visual alarms are present. )*

#### 2. Signs and labels:

*(Specify what signs and labels are required within the laboratory, including as a minimum: appropriate emergency telephone numbers; container labels, identifying contents (including waste receptacles); location signs of safety showers or eyewashes, especially if their location is not readily seen; and warnings at areas or equipment where special or unusual hazards exist. NOTE: do not use safety signs incorrectly or otherwise falsify a warning.)*

#### 3. Spills and accidents:

*(Specify those actions to be taken in the event that a chemical spill occurs, an employee is injured, a laboratory exhaust hood fails, or any other emergency occurs. Include the chain of command for reporting such occurrences and refer to those emergency response phone numbers given on Cover Page. Develop a spill prevention plan for chemical hazards inclusive of use of double containment when storing or while dispensing chemicals in fume hood or near sinks and the determination of any and all spill risks or potential for those chemicals in you lab.)*

#### 4. Emergency procedures:

*(Establish procedures to undertake during an evacuation or fire drill. Specify operation risks if left unattended during building evacuation Example-close sash on hood prior to evacuation in the event hoods fail during the building emergency.)*

#### 5. Laboratory storage:

*(Identify chemicals that require special storage such as refrigeration. Specify the maximum quantities of flammable chemicals to be stored within the laboratory. Consult Chapter 8.1 in 445-1-H or Appendix E for information on compatibility Chemical inventories is subject to a 5-year planning process, see section 6. Below.)*

6. Waste disposal:

*(Specify how chemicals are to be discarded, identify and list specific waste streams associated with this operation. Establish procedures for the collection of waste and storage within the lab prior to transfer to waste storage facility and include what chemicals, if any, can be discarded by way of the sanitary sewer system. Chemicals, which no longer serve a use to the current lab operation, are to be transferred to another lab for the beneficial use or disposed of as chemical waste. Any chemical products that you do not have plans to use within five years should be considered waste and disposed of. The Regional GD Safety Officer or Team Safety Officer can provide advice for waste disposal. Specify if any waste recycling programs are being used. Describe decontamination procedures in the event of a spill or other release, as well as the safe removal of the contaminated waste.)*

**Example:** The first step in proper waste management is to identify and characterize all wastes generated by your activities. This begins by thinking of laboratory operations in terms of waste generating operations. The following identifies categories of Geologic Division activities that do or could result in the creation of wastes.

Sample Collection-	This category includes all field operations and transportation activities that are intended to provide samples of materials for laboratory processing and analysis.
Sample Preparation-	This category includes all processes that are designed to prepare samples for laboratory examination and analysis by any means.
Photographic Processing-	This includes work in darkrooms that involve the use of corrosive liquids and silver-bearing materials to process photographic film.
Maintenance and Cleanup-	This category includes all activities designed, or to clean items used in the laboratory such as glassware and other types of vessels and container, tools, and equipment such as saws, grinders, analytical equipment, and the like.
Excess/Unusable Materials-	This category includes any chemical or other material being held in a laboratory or storage area that are not presently being used in any of the laboratory operations, no longer fit for the projected purposes of the laboratory, are contaminated or otherwise unusable.

7. Working alone:

No one is allowed to work alone when using extremely toxic or highly flammable chemicals, such as Class 1A flammables or Hydrofluoric Acid.

*(Specify whether working alone will be allowed. If working alone is unavoidable, specify those measures to be taken to ensure the worker's safety.)*

8. Unattended operations:

*(Specify what experiments or specialized equipment will be allowed to operate during off-hours. Determine the consequences of utility (water, power, or gas disruption), equipment, or other component failure such as coolant lines. Display on the door the names of individuals responsible for the laboratory so that in the event of an emergency, the responsible individual can be contacted to assist in stabilizing the emergency.)*

9. General rules or procedures:

No horseplay, suctioning by mouth, or eating, drinking, or smoking will be permitted in the laboratory. Report all unsafe practices or conditions to the responsible supervisor or other authority.

*(Use this section to refer to other sample preparation procedures documents or list various standard lab procedures such as sample prep, instrument maintenance, cleaning practices, reporting procedures, controls, etc...)*

#### B. Criteria to be used for Implementation of Measures to Reduce Exposures

1. Procurement and distribution: Before an extremely hazardous substance (e.g., high acute or chronic toxicity, class 1A flammable liquid, highly reactive chemical) is ordered, the supervisor will inform those who will be using the material on proper handling, storage, and disposal. Request a Material Safety Data Sheet (MSDS) each time a different chemical is ordered. MSDS are also available on the USGS Intranet Safety Home Page. Accept no container without an identifying label. If not in their original shipping containers, chemicals will be transported using a container such as a rubber acid bucket or other suitable device.

2. Environmental monitoring: Conduct environmental monitoring when there is any mechanical failure of the exhaust hood(s) or after any uncontrolled release of a hazardous chemical. Specify which chemicals in the lab present such hazards.

*(Specify who will be contacted to perform the monitoring.)*

3. Chemical inventories: Conduct an annual chemical inventory of laboratory chemicals. A copy of the inventory will be kept in the laboratory, and electronic copies distributed to the Chemical Hygiene Officer and the Regional Division Safety Officer. The inventory will follow the format provided by the Regional GD Safety Officer. Inventories will reside electronically in the Division Laboratory Information Management System (LIMS) accessible by your safety officer. When chemicals are disposed of, ensure the inventory reflects the change appropriately.

*(Specify what steps will be taken to monitor those chemicals with expiration dates.)*

#### C. Fume Hood Performance

##### 1. Use of laboratory hoods:

*(Specify the type(s) of hoods used in the laboratory and their basic operating procedures, such as baffle positioning and use and height of the hood sash. If canopy hoods or snorkel trunk hoods are used, note their limitations, and hood #'s and shaft.)*

2. Recommended hood face velocity: Determine hood face velocities no less than once per year. Average face velocities should be between 60 and 100 linear feet per minute (LFM); however, velocities up to 150 LFM are acceptable. Averages are determined by measuring the flow at the face, using no less than 3 uniform quadrants. Record on the hood the average LFM, date, and the initials of the person making the determination.

Hoods with average face velocities of less than 60 LFM will not be used for any toxic chemical. If hood average face velocities exceed 150 LFM, then smoke tubes or equivalent smoke generators will be used to determine if air turbulence exists within the hood. When the smoke is thrown back into the breathing zone of the user hood performance is unacceptable. When unacceptable turbulence is noted, identify the reason for the turbulence and take steps to improve the hood's performance. *(If the hood's performance cannot be improved, specify what additional protective equipment will be necessary.)*

##### 3. Special ventilation areas.

*(Use if any areas exist.)*

#### D. Employee Information and Training

*(Specify if specialized training will be required.)*

1. Chemical Hygiene Plan:

It is required that all lab personnel read, discuss, practice safety procedures listed within the CHP, and sign the training log within the CHP, signifying that they have read and understand the procedures and rules. All lab personnel must understand what to do in the event of an emergency, and where within the CHP to find hazard and/or chemical information, including MSDS information.

*(Provide information and training on the Chemical Hygiene Plan and where it is kept. Employees are to read the CHP on an annual basis at a minimum and at any time where changes have been made.)*

2. Hazard Communication:

*(Each laboratory worker must be provided with information regarding both chemical and physical hazards. The employee will be made aware of available resources (MSDS's, container labels, reference books, permissible exposure limits) and their location. Provide training that describes methods and observations for detecting the presence of hazardous chemicals and signs and symptoms of overexposure. Discuss first-aid treatment for exposure. The employee will receive this information before being allowed to work with chemicals.)*

3. Frequency of training: Conduct training on a regular basis, integrating the training into the overall safety program. Employees using hazardous laboratory equipment or extremely hazardous chemicals will receive specialized training.

A. All lab personnel must complete Hazard Communication Training prior to working in the lab.

B. It is recommended that all persons working in this laboratory take a Laboratory Safety Course.

#### E. Requirements for Prior Approval of Laboratory Activities:

*(Specify when supervisory approval is necessary before an employee is allowed to work with especially dangerous chemicals or equipment, such as when a known embryotoxin is used by a female employee of childbearing age. Another example would be when employees use chemicals with a high degree of chronic toxicity. (See attached select carcinogens list.)*

F. Medical Consultation and Surveillance: Seek medical consultation when an employee is exposed to a hazardous chemical due to failure of a laboratory hood or personal protective equipment, spill or other release, or environmental monitoring has determined the presence of an airborne contaminant above the recommended permissible exposure limit.

When medical consultation is required, provide the physician with specific information on the identity of the chemical, conditions under which the exposure occurred, and a description of the signs and symptoms of exposure. Ask the attending physician to provide a written opinion for recommended follow up examination and test results; any detected medical conditions of the employee that place the employee at increased risk; and a statement that the employee was informed of the results.

A medical surveillance program will be established for an employee when any employee is exposed to any chemical regulated by the Occupational Safety and Health Administration (SEE ATTACHED LIST) and the employee's exposure was deemed to be above the chemical's permissible exposure limit.

Laboratory workers are responsible for making the lab supervisor and others in authority aware of a changing health/medical condition, which would make it necessary to reevaluate the laboratory Job Hazard for them. EXAMPLE-pregnancy.

*(Specify if any voluntary medical surveillance programs are available to the employee.)*



#### G. Special Precautions for Work with Particularly Hazardous Substances

*(Specify any special procedures for working with any chemical that meets the following:*

- (1) The chemical is an allergen or embryotoxin (e.g., organomercurials, lead compounds, formamide);*
- (2) The chemical has a moderate chronic or a high acute toxicity (e.g., hydrofluoric acid, hydrogen cyanide); or*
- (3) The chemical has a high chronic toxicity (e.g., select carcinogens - see attached list). Any of those particularly hazardous chemicals must be used in designated areas that are clearly marked. Complete a written job hazard analysis and standard operating procedures for each operation that uses any of those substances.)*

Follow the job hazards analyses and operating procedures outlined in the appendices.

# TRAINING LOG

I, the undersigned, have read or reviewed the General Laboratory rules for \_\_\_\_\_ (Lab, Rm. \_\_\_\_\_, Bldg. \_\_\_\_\_), The Emergency Plan, and read and understand the Job Hazard Analysis and procedure description for the task I am to perform. I realize it is my responsibility to:

1. Follow and obey the rules, which are part of the regular operation.
2. Handle equipment properly, follow all safety recommendations, and use the equipment for the task intended.
3. Use and maintain all the required personal protective equipment prescribed for the task.
4. Report accidents and injuries, no matter how minor, to the lab supervisor and to obtain first aid and/or medical treatment.
5. Perform my job in the correct manner to reduce loss incidents to others, lab, the equipment, and myself.
6. Report all unsafe or hazardous conditions to the lab supervisor as soon as possible.

Print Name	Initials	Date	HAZCOM or other training	Date
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[illegible]

## Appendix A:

*[The JHA is task specific. Identify each task in the “Basic Job Steps” column and list all associated hazards for the task. Then outline the safe procedure to follow (include the use of engineering controls and PPE)]*

<b>JOB HAZARD ANALYSIS</b>		<b>JOB ACTIVITY:</b> <i>(List job activity that may be hazardous)</i>	
<b>BASIC JOB STEPS</b> <i>(List the basic job steps)</i>	<b>HAZARDS</b> <i>(List the hazards possible by doing the job)</i>	<b>SAFE JOB PROCEDURE</b> <i>(List the safe job procedures for the job)</i>	
Empty space for Basic Job Steps	Empty space for Hazards	Empty space for Safe Job Procedure	

## JOB HAZARD ANALYSIS

### JOB ACTIVITY:

*(List job activity that may be hazardous)*

#### BASIC JOB STEPS

*(List the basic job steps)*

#### HAZARDS

*(List the hazards possible by doing the job)*

#### SAFE JOB PROCEDURE

*(List the safe job procedures for the job)*

## Appendix B:

# ANNUAL ENVIRONMENTAL RISK ASSESSMENT LOG

AERIAL FY \_\_\_\_\_

ORGANIZATION: USGS GD \_\_\_\_\_ Region (TEAM NAME) \_\_\_\_\_

ADDRESS (BLDG. #): \_\_\_\_\_

LAB NAME AND RM. #: \_\_\_\_\_

LAB CLASSIFICATION (circle appropriate description): biological; chemical; electronic;  
instrument; mechanical/rock crusher; photographic; physics; machine shop

CHIEF SCIENTIST: \_\_\_\_\_ LAB SUPERVISOR: \_\_\_\_\_ TEAM

SAFETY OFFICER: \_\_\_\_\_

NAMES OF WORKERS \_\_\_\_\_

Is a Chemical Hygiene Plan in place and up to date? Circle Yes or No

Are written waste disposal policies in place? Circle Yes or No

Are drains connected to a neutralization sump? Circle Yes or No

Are drains connected to a sediment trap / sump? Circle Yes or No

### MATERIALS ENTERING DRAINS

CHEMICALS: (List each by Name & approx. amount per month)

METALS (in sol'n or solid) \_\_\_\_\_

ORGANICS (INSOLUBLE SOLVENTS & COMPOUNDS)

\_\_\_\_\_

INORGANICS (COMPOUNDS / SOLUTIONS)

\_\_\_\_\_

ACIDS: \_\_\_\_\_

BASES: \_\_\_\_\_

RADIOACTIVE MATERIALS: \_\_\_\_\_

GEOLOGIC SAMPLE RESIDUES: Circle Yes (Y) or No (N)

Clays: Y N

Sand/Silt: Y N

Rock Debris: Y N

Rock Saw Oils: Y N

Trace Metals: Y N

Drilling Mud: Y N

Rock Suspensions: Y N

### VOLATILE MATERIALS EXHAUSTED BY HOODS

CHEMICALS: (List each by Name or Formula & approx. amount per month)

ORGANICS (VOLATILE SOLVENTS & COMPOUNDS): \_\_\_\_\_

INORGANICS (COMPOUNDS / SOLUTIONS):

\_\_\_\_\_

ACIDS: \_\_\_\_\_

BASES: \_\_\_\_\_

RADIOACTIVE MATERIALS (is hood filtered? Y N): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Chief Scientist or Representative=s Signature

\_\_\_\_\_  
Lab Supervisor=s Signature

## **Appendix C:**

### **Chemical Hygiene Plan (CHP) Responsibilities**

**1. Laboratory supervisor: The laboratory supervisor is assigned and has overall responsibility for chemical safety in the laboratory. The supervisor has the following specific responsibilities, as a minimum:**

- (a) Ensures that a CHP is prepared for the laboratory, employees know and follow the Plan, appropriate and proper personal protective equipment is available and used, and training has been conducted.
- (b) Ensures that regular inspections are conducted and that substandard or hazardous acts or conditions are corrected.
- (c) Ensures that good housekeeping practices are in effect and that equipment such as hoods, showers and eyewashes are in working order.
- (d) Knows the current legal requirements of regulated chemicals and ensures that hazardous wastes are disposed of properly.
- (e) Ensures that a chemical inventory is completed annually for those areas assigned.
- (f) Reviews the Chemical Hygiene Plan annually to ensure that the Plan is up to date.

**2. Chemical Hygiene Officer: (Team Safety Officer):**

- (a) The TSO is responsible to verify that the laboratory supervisor performs all responsibilities.
- (b) Assists employees in obtaining Material Safety Data Sheets.
- (c) Identifies all unattended, overnight laboratory operations, reviewing and recommending failsafe devices or procedures designed to prevent an accident in the event of a component failure.
- (d) Review and report all laboratory accidents involving hazardous materials and recommends steps to prevent recurrence of similar accidents.

**3. Laboratory employee:**

- (a) Plans and conducts all laboratory operations in accordance with the Chemical Hygiene Plan for the laboratory.
- (b) Participates in the completion of the annual chemical inventory.
- (c) Practices good personal hygiene when working with hazardous chemicals, using required personal protective equipment and engineering controls.
- (d) Make supervisor and others in authority aware of changing health/medical condition, which would make it necessary to reevaluate the Job Hazard for them. EXAMPLE- pregnancy.

## Appendix D:

### Definitions

- a. Caustics - a substance that capable of destroying or eating away by chemical action.
- b. Combustible Liquids - A liquid having a flash point at or above 100 degrees F (37.8 degrees C) but below 200 degrees F (93.3 degrees C).
- c. Compressed Gases – 1. A gas or mixture of gases having in a container, an absolute pressure exceeding psi at 70 F (21.1 C) or; A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 F (54.4 C) regardless of the pressure at 70 F (21.1 C) or; A liquid having a vapor pressure exceeding 40 psi at 100 F (37.8 C) as determined by ASTM D-323-72.
- d. Extremely Hazardous Chemical – Any of the 406 chemicals identified by the EPA on the basis of toxicity, and listed under SARA Title III.
- e. Flammable Liquid, Class 1A - Any chemical with a flashpoint below 73 degrees Fahrenheit and a boiling point below 100 degrees Fahrenheit.
- f. Flashpoint - The minimum temperature at which a liquid gives off a vapor in sufficient concentration to burn in the presence of any ignition source.
- g. Hazardous Chemicals - Any chemical that, upon exposure, is known or can reasonably be expected to produce acute or chronic physiological harm, For example corrosives, carcinogens, combustibles, water reactive, etc...
- h. Hazardous Materials – Chemicals that fit within any of the hazard classes: Explosives, flammables, oxidizing materials, corrosives, gases, poisons, radioactive substances and agents capable of causing disease.
- i. Hazardous Substances – Substances which are deemed to pose imminent and substantial danger to public health and welfare; for example hazardous wastes, water pollutants, air pollutants, and substances that risk damage to the environment.
- j. Hazardous Waste – Hazardous waste displays any of the four regulated hazardous characteristics: ignitability, corrosivity, reactivity, and toxicity.
- k. JHA (Job Hazard Analysis) – A listing of the job activities, basic job steps, hazards, and safe job procedures of the laboratory which is included in the CHP.
- L. Laboratory - Any workplace where relatively small quantities of chemicals are used in a nonproduction basis, multiple chemical procedures or chemicals are used, and protective practices and equipment are available and in common use to minimize exposure to chemicals.
- m. Oxidizers - A chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.
- n. Perchloric Acid - a fuming corrosive strong acid  $\text{HClO}_4$  that is the most highly oxidized acid of chlorine and a powerful oxidizing agent when heated.
- o. Permissible Exposure Limit (PEL) - The concentration of a chemical that one can be exposed for 8 hours per day, 40 hours per week. (See 29 CFR 1910.1000 for existing PEL's.)
- p. Select Carcinogen - Any chemical or substance that is known or reasonably expected to cause cancer in humans as recognized by the National Toxicology Program (Department of Health and Human Services) or the International Agency for Research Cancer Monographs.

## APPENDIX E

### INCOMPATIBILITY OF COMMON LABORATORY CHEMICALS

When certain hazardous chemicals are stored or mixed together, violent reactions may occur because the chemicals are unsuitable for mixing, or are *incompatible*. Classes of incompatible chemicals should be segregated from each other during storage, according to hazard class. Use the following general guidelines for hazard class storage:

- Flammable/Combustible Liquids and Organic Acids
- Flammable Solids
- Mineral Acids
- Caustics
- Oxidizers
- Perchloric Acid
- Compressed Gases

Before mixing any chemicals, refer to this partial list, the chemicals' MSDS's or call the ORCBS to verify compatibility:

CHEMICAL	INCOMPATIBLE CHEMICAL(S)
<b>Acetic acid</b>	aldehyde, bases, carbonates, hydroxides, metals, oxidizers, peroxides, phosphates, xylene
<b>Acetylene</b>	halogens (chlorine, fluorine, etc.), mercury, potassium, oxidizers, silver
<b>Acetone</b>	acids, amines, oxidizers, plastics
<b>Alkali and alkaline earth metals</b>	acids, chromium, ethylene, halogens, hydrogen, mercury, nitrogen, oxidizers, plastics, sodium chloride, sulfur
<b>Ammonia</b>	acids, aldehydes, amides, halogens, heavy metals, oxidizers, plastics, sulfur
<b>Ammonium nitrate</b>	acids, alkalis, chloride salts, combustible materials, metals, organic materials, phosphorous, reducing agents, urea



<b>Aniline</b>	acids, aluminum, dibenzoyl peroxide, oxidizers, plastics
<b>Azides</b>	acids, heavy metals, oxidizers
<b>Bromine</b>	acetaldehyde, alcohols, alkalis, amines, combustible materials, ethylene, fluorine, hydrogen, ketones (acetone, carbonyls, etc.), metals, sulfur
<b>Calcium oxide</b>	acids, ethanol, fluorine, organic materials
<b>Carbon (activated)</b>	alkali metals, calcium hypochlorite, halogens, oxidizers
<b>Carbon tetrachloride</b>	benzoyl peroxide, ethylene, fluorine, metals, oxygen, plastics, silanes
<b>Chlorates</b>	powdered metals, sulfur, finely divided organic or combustible materials
<b>Chromic acid</b>	acetone, alcohols, alkalis, ammonia, bases
<b>Chromium trioxide</b>	benzene, combustible materials, hydrocarbons, metals, organic materials, phosphorous, plastics
<b>Chlorine</b>	alcohol's, ammonia, benzene, combustible materials, flammable compounds (hydrazine), hydrocarbons (acetylene, ethylene, etc.), hydrogen peroxide, iodine, metals, nitrogen, oxygen, sodium hydroxide
<b>Chlorine dioxide</b>	hydrogen, mercury, organic materials, phosphorous, potassium hydroxide, sulfur
<b>Copper</b>	calcium, hydrocarbons, oxidizers
<b>Hydroperoxide</b>	reducing agents
<b>Cyanides</b>	acids, alkaloids, aluminum, iodine, oxidizers, strong bases
<b>Flammable liquids</b>	ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
<b>Fluorine</b>	alcohol's, aldehydes, ammonia, combustible materials, halocarbons, halogens, hydrocarbons, ketones, metals, organic acids
<b>Hydrocarbons (Such as butane, propane benzene, turpentine, etc.)</b>	acids, bases, oxidizers, plastics
<b>Hydrofluoric acid</b>	metals, organic materials, plastics, silica (glass), (anhydrous) sodium
<b>Hydrogen peroxide</b>	acetylaldehyde, acetic acid, acetone, alcohol's carboxylic acid, combustible materials, metals, nitric acid, organic compounds, phosphorous, sulfuric acid, sodium, aniline

<b>Hydrogen sulfide</b>	acetylaldehyde, metals, oxidizers, sodium
<b>Hypochlorites</b>	acids, activated carbon
<b>Iodine</b>	acetylaldehyde, acetylene, ammonia, metals, sodium
<b>Mercury</b>	acetylene, aluminum, amines, ammonia, calcium, fulminic acid, lithium, oxidizers, sodium
<b>Nitrates</b>	acids, nitrites, metals, sulfur, sulfuric acid
<b>Nitric acid</b>	acetic acid, acetonitrile, alcohol's, amines, (concentrated) ammonia, aniline, bases, benzene, cumene, formic acid, ketones, metals, organic materials, plastics, sodium, toluene
<b>Oxalic acid</b>	oxidizers, silver, sodium chlorite
<b>Oxygen</b>	acetaldehyde, secondary alcohol's, alkalis and alkalines, ammonia, carbon monoxide, combustible materials, ethers, flammable materials, hydrocarbons, metals, phosphorous, polymers
<b>Perchloric acid</b>	acetic acid, alcohols, aniline, combustible materials, dehydrating agents, ethyl benzene, hydriotic acid, hydrochloric acid, iodides, ketones, organic material, oxidizers, pyridine
<b>Peroxides, organic</b>	acids (organic or mineral)
<b>Phosphorus (white)</b>	oxygen (pure and in air), alkalis
<b>Potassium</b>	acetylene, acids, alcohols, halogens, hydrazine, mercury, oxidizers, selenium, sulfur
<b>Potassium chlorate</b>	acids, ammonia, combustible materials, fluorine, hydrocarbons, metals, organic materials, sugars
<b>Potassium perchlorate (also see chlorates)</b>	alcohols, combustible materials, fluorine, hydrazine, metals, organic matter, reducing agents, sulfuric acid
<b>Potassium permanganate</b>	benzaldehyde, ethylene glycol, glycerol, sulfuric acid
<b>Silver</b>	acetylene, ammonia, oxidizers, ozonides, peroxyformic acid
<b>Sodium</b>	acids, hydrazine, metals, oxidizers, water
<b>Sodium nitrate</b>	acetic anhydride, acids, metals, organic matter, peroxyformic acid, reducing agents

<b>Sodium peroxide</b>	acetic acid, benzene, hydrogen sulfide metals, oxidizers, peroxyformic acid, phosphorous, reducers, sugars, water
<b>Sulfides</b>	acids
<b>Sulfuric acid</b>	potassium chlorates, potassium perchlorate, potassium permanganate

## Appendix F:

### List of Select and Suspected Carcinogens

This list is provided as a guide and is not all inclusive. Carefully review material safety data sheets before working with chemicals.

A-alpha-C (2-Amino-9H-pyrido{2,3-b}indole)

26148-68-5

Acetaldehyde

76-07-0

Acetamide

60-35-5

Acetochlor

34256-82-1

2-Acetylaminofluorene

53-96-3

Acifluorfen

62476-59-9

Acrylamide

79-06-1

Acrylonitrile

107-13-1

Actinomycin D

50-76-0

Adriamycin (Doxorubicin hydrochloride)

23214-92-8

AF-2; [2-(2-furyl)-3-(5-nitro-2-furyl)]acrylamide

3588-53-7

Aflatoxins

---

Alachlor

15972-60-8

Aldrin

309-00-2

Allyl chloride

107-05-1

2-Aminoanthraquinone

117-79-3

p-Aminoazobenzene

ortho-Aminoazotoluene

97-56-3

4-Aminobiphenyl (4-aminodiphenyl)

92-67-1

3-Amino-9-ethylcarbazole hydrochloride

6109-97-3

1-Amino-2-methylanthraquinone  
82-28-0  
2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazole  
712-68-5  
Amitrole  
61-82-5  
Aniline  
62-53-3  
ortho-Anisidine  
90-04-0  
ortho-Anisidine hydrochloride  
134-29-2  
Antimony oxide (Antimony trioxide)  
1309-64-4  
Aramite  
140-57-8  
Arsenic (inorganic arsenic compounds)  
---  
Asbestos  
1332-21-4  
Auramine  
492-80-8  
Azaserine  
115-02-6  
Azathioprine  
446-86-6  
Azacitidine  
320-67-2  
Azobenzene  
103-33-3  
Benz[a]anthracene  
56-55-3  
Benzene  
71-43-2  
Benzidine [and its salts]  
92-87-5  
Benzo [b] fluoranthene  
205-99-2  
Benzo [j] fluoranthene  
205-82-3  
Benzo [k] fluoranthene  
207-08-9  
Benzofuran  
271-89-6  
Benzo [a] pyrene  
50-32-8

Benzotrichloride

98-07-7

Benzyl chloride

100-44-7

Benzyl violet 4B

1694-09-3

Beryllium and beryllium compounds

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Betel quid with tobacco

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Bis(2-chloroethyl)ether

111-44-4

N,N,-Bis(2-chloroethyl)-2-naphthylamine (Chlornapazine)

494-03-1

Bischloroethyl nitrosourea (BCNU) (Carmustine)

154-93-8

Bis (chloromethyl) ether

542-88-1

Bitumens, extracts of steam-refined and air-refined

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Bracken fern

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Bromodichloromethane

75-27-4

Bromoform

75-25-2

1,3-Butadiene

106-99-0

1,4-Butanediol dimethanesulfonate (Busulfan)

55-98-1

Butylated hydroxyanisole

25013-16-5

beta-Butyrolactone

3068-88-0

Cadmium and cadmium compounds

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Captafol

2425-06-1

Captan

133-06-2

Carbon tetrachloride

56-23-5

Carbon-black extracts

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Ceramic fibers

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Chlorambucil  
305-03-3  
Chloramphenicol  
56-75-7  
Chlordane  
57-74-9  
Chlordecone (Kepone)  
143-50-0  
Chlordimeform  
115-28-6  
Chlorendic acid  
115-28-6  
Chlorinated paraffins  
108171-26-2  
Chlorodibromomethane  
124-48-1  
Chloroethane (Ethyl chloride)  
75-00-3  
1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea  
13010-47-4  
1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea (Methyl-CCNU)  
13909-09-6  
Chloroform  
67-66-3  
Chloromethyl methyl ether  
107-30-2  
3-Chloro-2-methylpropene  
563-47-3  
4-Chloro-ortho-phenylenediamine  
95-83-0  
p-Chloro-o-toluidine  
95-69-2  
Chlorothalonil  
1897-45-6  
Chlorozotocin  
54749-90-5  
Chromium (hexavalent)  
---  
Chrysene  
218-01-9  
C. I. Acid Red 114  
6459-94-5  
C. I. Basic Red 9 monohydrochloride  
569-61-9  
Ciclosporin (Cyclosporin A; Cyclosporine)  
59865-13-3;79217-60-0

Cinnamyl anthranilate  
87-29-6  
Cisplatin  
15663-27-1  
Citrus Red No. 2  
6358-53-8  
Cobalt metal powder  
7440-48-4  
Cobalt [II] oxide  
1307-96-6  
Conjugated estrogens  
---  
Creosotes  
---  
para-Cresidine  
120-71-8  
Cupferron  
135-20-6  
Cycasin  
14901-08-7  
Cyclophosphamide (anhydrous)  
50-18-0  
Cyclophosphamide (hydrated)  
6055-19-2  
D&C Orange No. 17  
346-83-1  
D&C Red No. 8  
2092-56-0  
D&C Red No. 9  
5160-02-1  
D&C Red No. 19  
81-88-9  
Dacarbazine  
4342-03-4  
Daminozide  
1596-84-5  
Dantron (Chrysazin; 1,8-Dihydroxyanthraquinone)  
117-10-2  
Daunomycin  
20830-81-3  
DDD (Dichlorodiphenyldichloroethane)  
72-54-8  
DDE (Dichlorodiphenyldichloroethylene)  
72-55-9  
DDT (Dichlorodiphenyltrichloroethane)  
50-29-3



DDVP (Dichlorvos)  
62-73-7  
N,N'-Diacetylbenzidine  
613-35-4  
2,4-Diaminoanisole  
615-05-4  
2,4-Diaminoanisole sulfate  
39156-41-7  
4,4'-Diaminodiphenyl ether (4,4'-Oxydianiline)  
101-80-4  
2,4-Diaminotoluene  
95-80-7  
Diaminotoluene (mixed)  
---  
Dibenz[a,h]acridine  
226-36-8  
Dibenz[a,j]acridine  
224-42-0  
Dibenz[a,h]anthracene  
53-70-3  
7H-Dibenzo[c,g]carbazole  
194-59-2  
Dibenzo[a,e]pyrene  
192-65-4  
Dibenzo[a,h]pyrene  
189-64-0  
Dibenzo[a,i]pyrene  
189-55-9  
Dibenzo[a,l]pyrene  
191-30-0  
1,2-Dibromo-3-chloropropane (DBCP)  
96-12-8  
p-Dichlorobenzene  
106-46-7  
3,3'-Dichlorobenzidine  
91-94-1  
1,4-Dichloro-2-butene  
76441-0  
3,3'-Dichloro-4,4'-diaminodiphenyl ether  
28434-86-8  
1,1-Dichloroethane  
75-34-3  
Dichloromethane (Methylene chloride)  
75-09-2  
1,2-Dichloropropane  
78-87-5

1,3-Dichloropropene

542-75-6

Dieldrin

60-57-1

Dienestrol

84-17-3

Diepoxybutane

1464-53-5

Diesel engine exhaust

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Di(2-ethylhexyl)phthalate

117-81-7

1,2-Diethylhydrazine

1615-80-1

Diethyl sulfate

64-67-5

Diethylstilbestrol

56-53-1

Diglycidyl resorcinol ether (DGRE)

101-90-6

Dihydrosafrole

94-58-6

3,3'-Dimethoxybenzidine (ortho-Dianisidine)

119-90-4

3,3'-Dimethoxybenzidine dihydrochloride (ortho- Dianisidine dihydrochloride)

20325-40-0

Dimethylcarbamoyl chloride

79-44-7

1,1-Dimethylhydrazine (UDMH)

57-14-7

1,2-Dimethylhydrazine 540-73-8

Dimethylvinylchloride

513-37-1

1,6-Dinitropyrene

42397-64-8

1,8-Dinitropyrene

42397-65-9

2,4-Dinitrotoluene

121-14-2

1,4-Dioxane

123-91-1

Diphenylhydantoin (Phenytoin)

57-41-0

Diphenylhydantoin (Phenytoin), sodium salt

630-93-3

Direct Black 38 (technical grade)  
1937-37-7  
Direct Blue 6 (technical grade)  
2602-46-2  
Direct Brown 95 (technical grade)  
16071-86-6  
Disperse Blue 1  
2475-45-8  
Epichlorohydrin  
106-89-8  
Erionite  
12510-42-8  
Estradiol 17 $\beta$   
50-28-2  
Estrone  
53-16-7  
Ethinylestradiol  
57-63-6  
Ethyl acrylate 140-88-5  
Ethyl methanesulfonate  
62-50-0  
Ethyl-4-4'-dichlorobenzilate  
510-15-6  
Ethylene dibromide  
106-93-4  
Ethylene dichloride (1,2-Dichloroethane)  
107-06-2  
Ethylene oxide  
75-21-8  
Ethylene thiourea  
96-45-7  
Ethyleneimine 151-56-4  
Folpet  
133-07-3  
Formaldehyde  
50-00-0  
2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thiazole  
3570-75-0  
Furazolidone  
67-45-8  
Furmecyclox  
60568-05-0  
Glu-P-1 (2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole)  
67730-11-4  
Glycidaldehyde  
765-34-4

Glycidol  
556-52-5  
Griseofulvin  
126-07-8  
Gyromitrin (Acetaldehyde methylformylhydrazone)  
16568-02-8  
HC Blue 1  
2784-94-3  
Heptachlor76-44-8  
Heptachlor epoxide  
1024-57-3  
Hexachlorobenzene  
118-74-1  
Hexachlorocyclohexane (technical grade)  
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Hexachlorodibenzodioxin  
34465-46-8  
Hexachloroethane  
67-72-1  
Hexamethylphosphoramide  
680-31-9  
Hydrazine  
302-01-2  
Hydrazine sulfate  
10034-93-2  
Hydrazobenzene (1,2-Diphenylhydrazine)  
122-66-7  
Indeno [1,2,3-cd]pyrene  
193-39-5  
IQ (2-Amino-3-methylimidazp[4,5-f]quinoline)  
76180-96-6  
Iron dextran complex  
9004-66-4  
Isosafrole  
120-58-1  
Lactofen  
77501-63-4  
Lasiocarpine  
303-34-4  
Lead acetate  
301-04-2  
Lead phosphate  
7446-27-7  
Lead subacetate  
1335-32-6

Lindane

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Mancozeb

8018-01-7

Maneb

12427-38-2

Me-A-alpha-C (2-Amino-3-methyl-9H-pyrido[2,3-b]indole)

68005-83-7

Medroxyprogesterone acetate

71-58-9

Melphalan

148-82-3

Merphalan

531-76-0

Mestranol

72-33-3

8-Methoxypsoralen with ultraviolet A therapy

298-81-7

5-Methoxypsoralen with ultraviolet A therapy

484-20-8

2-Methylaziridine (Propyleneimine)

75-55-8

Methylazoxymethanol

590-96-5

Methylazoxymethanol acetate

592-62-1

3-Methylcholanthrene

56-49-5

5-Methylchrysene

3697-24-3

4,4'-Methylene bis(2-chloroaniline)

101-14-4

4,4'-Methylene bis(N,N-dimethyl)benzenamine

101-61-1

4,4'-Methylene bis(2-methylaniline)

838-88-0

4,4'-Methylenedianiline

101-77-9

4,4'-Methylenedianiline dihydrochloride

13552-44-8

Methylhydrazine and its salts

13552-44-8

Methyl iodide

74-88-4

Methyl methanesulfonate

66-27-3

2-Methyl-1-nitroanthraquinone  
129-15-7  
N-Methyl-N'-nitro-N-nitrosoguanidine  
70-25-7  
N-Methylolacrylamide  
924-42-5  
Methylthiouracil  
56-04-2  
Metiram  
9005-42-2  
Metronidazole  
443-48-1  
Michler's ketone  
90-94-8  
Mirex  
2385-85-5  
Mitomycin C  
50-07-7  
Monocrotaline  
315-22-0  
5-(Morpholinomethyl)-3-[(5-nitro-furfurylidene)-amino]-2-oxalolidinone  
139-91-3  
Mustard Gas  
505-60-2  
Nafenopin  
3771-19-5  
1-Naphthylamine  
124-32-7  
2-Naphthylamine  
91-59-8  
Nickel and certain nickel compounds  
---  
Nickel carbonyl  
13463-39-3  
Nickel subsulfide  
12035-72-2  
Niridazole  
61-47-4  
Nitrilotriacetic acid  
139-13-9  
Nitrilotriacetic acid, trisodium salt monohydrate  
18662-53-8  
5-Nitroacenaphthene  
602-87-9  
5-Nitro-o-anisidine  
99-59-2

4-Nitrobiphenyl  
93-93-3  
6-Nitrochrysene  
7496-02-8  
Nitrofen (technical grade)  
1836-75-5  
2-Nitrofluorene  
607-57-8  
Nitrofurazone  
59-87-0  
1-[5-Nitrofurfurylidene)-amino]-2-imidazolidinone  
555-84-0  
N-[4-(5-Nitro-2-furyl)-2-thiazolyl]acetamide  
531-82-8  
Nitrogen mustard (Mechlorethamine)  
51-75-2  
Nitrogen mustard hydrochloride (Mechlorethamine hydrochloride)  
55-86-7  
Nitrogen mustard N-oxide  
126-85-2  
Nitrogen mustard N-oxide hydrochloride  
302-70-5  
2-Nitropropane  
79-46-9  
1-Nitropyrene  
5522-43-0  
4-Nitropyrene  
57835-92-4  
N-Nitrosodi-n-butylamine  
924-16-3  
N-Nitrosodiethanolamine  
1116-54-7  
N-Nitrosodiethylamine  
55-18-5  
N-Nitrosodimethylamine  
62-75-9  
p-Nitrosodiphenylamine  
156-10-5  
N-Nitrosodiphenylamine  
86-30-6  
N-Nitrosodi-n-propylamine  
621-64-7  
N-Nitroso-N-ethylurea  
759-73-9  
3-(N-Nitrosomethylamino)propionitrile  
60153-49-3

4-(N-Nitrosomethylamino)-1-(3-pyridyl)1-butanone

64091-91-4

N-Nitrosomethylethylamine

10595-95-6

N-Nitroso-N-methylurea

684-93-5

N-Nitroso-N-methylurethane

615-53-2

N-Nitrosomethylvinylamine

4549-40-0

N-Nitrosomorpholine

59-89-2

N-Nitrosornicotine

16543-55-8

N-Nitrosopiperidine

100-75-4

N-Nitrosopyrrolidine

930-55-2

N-Nitrososarcosine

13256-22-9

Norethisterone (Norethindrone)

68-22-4

Ochratoxin A

303-47-9

Oxadiazon

19666-30-9

Oxymetholone

434-07-1

Panfuran S

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Pentachlorophenol

87-86-5

Phenacetin

62-44-2

Phenazopyridine

94-78-0

Phenazopyridine hydrochloride

136-40-3

Phenesterin

3546-10-9

Phenobarbital

50-06-6

Phenoxybenzamine

59-96-1

Phenoxybenzamine hydrochloride

63-92-3



Phenyl glycidyl ether  
122-60-1  
Phenylhydrazine and its salts  
---  
o-Phenylphenate, sodium  
132-27-4  
Polybrominated biphenyls  
---  
Polychlorinated biphenyls  
---  
Polygeenan  
53973-98-1  
Ponceau MX  
3761-53-3  
Ponceau 3R  
3564-09-8  
Potassium bromate  
7758-01-2  
Procarbazine  
671-16-9  
Procarbazine hydrochloride  
366-70-1  
Progesterone  
57-83-0  
1,3-Propane sultone  
1120-71-4  
beta-Propiolactone  
57-57-8  
Propylene oxide  
75-56-9  
Propylthiouracil  
51-52-5  
Reserpine  
50-55-5  
Saccharin  
81-07-2  
Saccharin, sodium  
128-44-9  
Safrole  
94-59-7  
Selenium sulfide  
7446-34-6  
Silica, crystalline  
---  
Streptozotocin  
18883-66-4

Styrene oxide

96-09-3

Sulfallate

95-06-7

Talc' containing asbestiform fibers

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Testosterone and its esters

58-22-0

2,3,7,8-Tetrachlorodibenzo-para-dioxin (TCDD)

1746-01-6

1,1,2,2-Tetrachloroethane

79-34-5

Tetrachloroethylene (Perchloroethylene)

127-18-4

p-a, a, a-Tetrachlorotoluene

5216-25-1

Tetranitromethane

509-14-8

Thioacetamide

62-55-5

4,4' - Thiodianiline

139-65-1

Thiourea

62-56-6

Thorium dioxide

1314-20-1

Toluene diisocyanate

26471-62-5

ortho-Toluidine

95-53-4

ortho-Toluidine hydrochloride

636-21-5

para-Toluidine

106-49-0

Toxaphene (Polychlorinated camphenes)

8001-35-2

Trasulfan

299-75-2

Trichlormethine (Trimustine hydrochloride)

817-09-4

2,4,6-Trichlorophenol

88-06-2

Triphenyltin hydroxide

76-87-9

Trichloroethylene

79-01-6

Tris (aziridinyl)-para-benzoquinone (Triaziquone)  
68-76-8  
Tris (1-aziridinyl) phosphine sulfide (Thiotepa)  
52-24-4  
Tris (2-chloroethyl) phosphate  
115-96-8  
Tris (2,3-dibromopropyl) phosphate  
126-72-7  
Trp-P-1 (Tryptophan-P-1)  
62450-06-0  
Trp-P-2 (Tryptophan-P-2)  
62450-07-1  
Trypan blue (commercial grade)  
72-57-1  
Uracil mustard  
66-75-1  
Urethane (Ethyl carbamate)  
51-79-6  
Vinyl bromide  
593-60-2  
Vinyl chloride  
75-01-4  
4-Vinyl-1-cyclohexene diepoxide (Vinyl cyclohexene dioxide)  
106-87-6  
Vinyl trichloride (1,1,2-Trichloroethane)  
79-00-5  
2,6-Xylidine (2,6-Dimethylaniline)  
87-62-7  
Zineb  
12122-67-7  
Revised 1/96

## Appendix G:

### LIST OF OSHA REGULATED SUBSTANCES

1,2-dibromo-3-chloropropane. (1910.1044)  
2-Acetylaminofluorene. (1910.1014)  
3,3'-Dichlorobenzidine (and its salts) (1910.1007)  
4-Aminodiphenyl. (1910.1011)  
4-Dimethylaminoazobenzene. (1910.1015)  
4-Nitrobiphenyl. (1910.1003)  
Acrylonitrile. ( 1910.1045)  
alpha-Naphthylamine. (1910.1004)  
Asbestos, tremolite, anthophyllite, and actinolite. (1910.1001)  
Asbestos. (1910.1101)  
Benzene. (1910.1028)  
Benzidine. (1910.1010)  
Beta-Naphthylamine. (1910.1009)  
beta-Propiolactone. (1910.1013)  
bis-Chloromethyl ether. (1910.1008)  
Coal tar pitch volatiles; interpretation of term. (1910.1002)  
Coke oven emissions. (1910.1029)  
Cotton dust. (1910.1043)  
Ethylene oxide. (1910.1047)  
Ethyleneimine. (1910.1012)  
Formaldehyde. (1910.1048)  
Inorganic arsenic. (1910.1018)  
Lead. (1910.1025)  
Methyl chloromethyl ether. (1910.1006)  
N-Nitrosodimethylamine. (1910.1016)



## Appendix H

### Radiation Safety

#### A. General

1. All persons using radioactive isotopes or using a mass spectrometer in which radioactive samples are used, are required to take the RAC's radiation safety course.
2.  $^{230}\text{Th}$ ,  $^{232}\text{Th}$ ,  $^{235}\text{U}$ ,  $^{236}\text{U}$ ,  $^{238}\text{U}$ , and  $^{233}\text{U}$  are all used in small quantities in this laboratory. The quantities used are so small that short term exposure effects may not be evident, but longer term effects (such as cancer) may be caused unless proper safety procedures are employed.
3. Principal types of radiation encountered in this lab:
  - a.  $\alpha$ -emission: Decay by emission of an  $\alpha$ -particle ( $2p + 2A$ )

This is the most dangerous type of radiation, but it is the least penetrative. The layers of dead skin will prevent penetration. However, when taken internally or exposed to an open wound, it is quite a dangerous gas -- most of these isotopes are "bone seekers". Always wear gloves when handling radioactive materials. All isotopes used in this lab are  $\alpha$ -emitters; some are also  $\beta$ -emitters.
  - b.  $\gamma$ -rays: Energy released during a nuclear reaction.

Very penetrative. Only lead or similarly dense material will prevent penetration. Proper handling (section B) is the only prevention from over-exposure.
  - c.  $^{235}\text{U}$  and  $^{233}\text{U}$  are specially regulated fissile material under 10 CFR 70.4 (m) (NRC) and are subject to records of receipt, disposal, possession, and material balance accounting. Therefore, all usage, spills, etc. must be documented.

#### B. Handling of radioactive materials:

1. Dispose of used radioactive filaments in the beaker provided. Empty this frequently into the jar provided in the source room. These are then disposed of by the Radiation Safety Office in Bldg. 15. Always take care of your own filaments. Then no one has to guess if they are radioactive or not.

2. When loading a radioactive sample, make sure "kim-wipes" are put down to catch any spattering. Change "kim-wipes" at least once a week. "Kim-wipes" and other contaminated material should be placed in a sealed plastic bag and then placed in the container marked "Radioactive Waste" under the table in the balance room. This material is then disposed of by contacting the reactor safety people (Bill Smith or Pat Kraken) in Bldg. 15.
3. Always wear gloves when handling radioactive materials, and always wash your hands with soap and water afterward.
4. Always wash the bench where you have been using radioactive materials with soap and water, whether or not you think you spilled anything.
5. Never pipet radioactive materials by mouth, and never carry them in your pocket or otherwise on your person. Handle as little as possible and use tongs whenever possible.
6. Check possible contamination areas once a month with the                      d-scintillation counter in conjunction with the Branch Safety Officer. He will also make wipe tests of these areas once each quarter.

C. Radiation Spills:

1. Radiation spills should be handled in accordance with the attached memo.
2. Dispose of materials used to clean up the spill in the container marked "Radioactive Waste" under the balance table, or in accordance with the attached memo.

